

REMARKS

Claims 1-8 and 10-17 are pending in the above-identified application, of which claims 19-28 are withdrawn. Claims 1-8 and 10-17 were rejected. Accordingly, claims 1-8 and 10-17 are at issue in the above-identified application.

35 U.S.C. § 102 Anticipation Rejection of Claims & 35 U.S.C. § 103 Obviousness Rejection of Claims

Claims 1-3, 8-12, 17 and 18 were rejected under 35 U.S.C. § 102(e) as being anticipated by *Carey et al.* (U.S. Patent No. 6,452,761). Claims 4-7 and 13-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over *Carey et al.* Applicant respectfully traverses these rejections.

Claim 1 recites a magnetoresistance-effect element comprising a magnetism-sensing section the electric resistance of which changes in accordance with an external magnetic field, a low-resistance metal layer contacting the magnetism-sensing section, and an oxide layer provided on that surface of the low-resistance metal layer which faces away from the magnetism-sensing section, *wherein a total thickness of the low-resistance metal layer and oxide layer ranges from 0.5 nm to 1.5 nm.* *Carey et al.* teaches a typical magnetic sensor device having a magnetic sensor element laminated between two insulating gap layers. Fig. 2A of *Carey et al.* illustrates a partial magnetic sensor structure 22, wherein a suitable substrate 36 is provided with a magnetic shield layer 34. Magnetic shield layer 34 is preferably a NiFe alloy layer or the soft magnetic material that has been previously deposited on the substrate 36. *Carey et al.* then goes on to state that on the magnetic shield layer 34, a metal layer 33 is deposited to a thickness of *between 5 and 200 angstroms.* *Carey et al.* further goes on to state that the thickness of an oxidized metal layer 43 produced by a method described in column 5 of *Carey et al.* depends on

the type of metal layer deposited, the reactive oxygen source used and the reaction conditions.

Carey et al. then states an example in which an aluminum metal layer deposited to a layer of 100 angstroms *or thicker* and then exposed to an oxygen plasma source, the oxidized metal layer formed is *typically 20 angstroms thick or less*. The Examiner has taken this statement to mean that there is a 20 percent reduction in thickness after oxidation. However, Applicant's believe that this is inaccurate.

Carey et al. does not disclose reduction in thickness of the aluminum metal layer. What *Carey et al.* actually discloses is that upon oxidation, an oxidized layer is formed which is 20 angstroms thick or less. The aluminum metal layer that is deposited is still 100 angstroms *or thicker*.

While it may be reduced some by the forming of the oxidized layer, *Carey et al.* remains silent as to the total thickness, after oxidation, of both the aluminum metal layer and the oxidized layer. Applicant's claim a *total thickness* of a *low resistance metal layer* and an *oxide layer* which ranges from 0.5 nanometers to 1.5 nanometers. *Carey et al.* never discloses a total thickness of a low resistance metal layer and an oxide layer which meets this specific and narrow range. While *Carey et al.* discloses depositing a aluminum layer of 100 angstroms or thicker and forming an oxide layer of 20 angstroms or less, *Carey et al.* never discusses whether the total thickness of the remainder of the aluminum metal layer after oxidation and the oxidized metal layer which is formed upon oxidation, whether that total thickness is between 0.5 nanometers to 1.5 nanometers. Additionally, *Carey et al.* never discusses a 20 percent reduction in thickness of any type of layer upon oxidation. While *Carey et al.* discusses forming an oxide metal layer, which is 20 angstroms thick or less, it does state that the aluminum metal layer is reduced to 20 percent of its total thickness or that the combination of the aluminum metal layer and after the

oxidation layer is 20 percent the thickness of the initial aluminum metal layer which is deposited to a thickness of 100 angstroms or thicker.

Therefore, Applicant's conclude that *Carey et al.* fails to teach or disclose a magneto-resistance effect element wherein a total thickness of a low resistance metal layer and oxide layer ranges from 0.5 nanometers to 1.5 nanometers. Withdrawal of these rejections are respectfully requested.

In view of the foregoing, Applicant submits that the application is in condition for allowance. Notice to that effect is requested.

Respectfully submitted,

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